

NON-PUBLIC?: N
ACCESSION #: 8910180338
LICENSEE EVENT REPORT (LER)

FACILITY NAME: ST. LUCIE, UNIT 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000335

TITLE: REACTOR TRIP DUE TO INADEQUATE PRE-MAINTENANCE REVIEW
EVENT DATE: 09/13/89 LER #: 89-005-00 REPORT DATE: 10/13/89

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 098

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: CHARLES D. HOLIFIELD, SHIFT TECHNICAL ADVISOR
TELEPHONE: 407-465-3550

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On September 13, 1989, at 1409, while in Mode 1 at 98% power, Unit 1 tripped on Loss of Load. Prior to the trip, there were two Nuclear Plant Work Orders (NPWO) being worked concurrently on the Reactor Plant Protection System (RPS). One of the NPWO's involved removing TCB-1 for maintenance while the other NPWO was for replacing a "C" channel power supply in the RPS cabinet. In order to replace the power supply, breaker CB-3 inside the RPS cabinet was opened. When this was done, TCB-7 and TCB-3 opened and with TCB-1 already open, a turbine and reactor trip occurred.

The root cause of the reactor trip was determined to be an inadequate NPWO work description, inadequate communications to Operations by I&C and the procedure for Unit Reliability-Sensitive Systems did not clearly show that its use was required.

Corrective actions: review/revise Sensitive Systems Procedures, write standard work descriptions to be attached to NPWO's for RPS power supply replacements, add caution statements to I&C procedures to check the TCB's position and expedite plant changes to replace RPS power supplies.

END OF ABSTRACT

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DESCRIPTION OF THE EVENT

On September 13, 1989, Unit 1 was in Mode 1 at a reduced power level of 98% to control turbine backpressure which had been increasing due to high injection temperature.

At 0508 reactor control breaker (EIIS:BKR), TCB-1, was placed out of service for maintenance in accordance with Electrical Maintenance procedure 1-EMP-63.01. This quarterly PM was performed using a Nuclear Plant Work Order (NPWO) which was approved by the ANPS.

At 0921 I&C started the monthly functional test of the Reactor Protection System (RPS) (EIIS:JC) in accordance with I&C Procedure 1-1400050. This PM was performed using a NPWO which was approved by the ANPS.

While performing the RPS monthly functional test, an RPS channel "C" Core Protection Calculator (CPC-2) power supply voltage was found to be outside of allowable limits. Since this indicated a power supply failure, the I&C technician left the RPS monthly procedure in order to repair the failed power supply.

Because of the power supply (EIIS:RJX) failure in CPC Channel "C", the trip bistables for Hi Power, SUR, TM/LP, LPD, and Loss of Load (1, 2, 7, 8 & 10) were placed in bypass in accordance with Technical Specification 3.3.1.1 by using the RPS channel bypass keys. This switch manipulation was logged in the operator's chronological log and the valve, switch deviation log.

The repair to the faulted power supply was performed using a NPWO which was approved by the ANPS. The explanation of the work to be done, which was given to the ANPS, was that the remaining "C" channel bistables were to be placed in bypass, the RPS "C" channel was to be powered down and the faulted power supply replaced. There was no indication in the work description or the explanation given to the ANPS that any TCB's would be opened. In order to deenergize the 120 VAC in the work area, the I&C Supervisor supervising the work opened CB/C and CB-3. He did this

knowing that two TCB's would open, but he assumed the other TCB's were

shut and there would not be a problem.

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Prior to opening CB-3, he informed the control room operators. However, he did not tell them that the K3 relay would deenergize and that the two TCB's would open. Since CB-3 is a breaker located inside the RPS cabinet that the operators don't normally operate, they did not realize that the TCB's would open if CB-3 was opened. With CB-3 open, the K3 relay deenergized causing TCB-7 and TCB-3 to open. Under normal conditions opening TCB-7 and TCB-3 would not cause a trip since there is a redundant power supply via TCB-1 and TCB-2. However, with TCB-1 removed and TCB-7/TCB-3 opened, power to half of the CEDM coils was interrupted. The deenergized CEA bus caused the turbine to trip which caused the Loss of Load Trip. This caused the remaining CEDM coils to deenergize and a full reactor trip to occur.

The operators then performed the actions of I-EOP-1, Standard Post Trip Actions, and I-EOP-2, Reactor Trip Recovery.

CAUSE OF THE EVENT

The root causes of this event were:

1. The work description given in the Job Planning Section of the NPWO did not tell the ANPS specifically what work was to be done.
2. The I&C Supervisor did not adequately explain the work to be performed.
3. As the Unit Reliability-Sensitive Systems procedure is presently written, there is no reference to breaker operation by non-operations personnel.

ANALYSIS OF THE EVENT

The plant response during this trip was observed to be normal; all systems functioned as designed.

This event has been deemed reportable as per the requirements of 10 CFR 50.73 (a) (2) (iv), any event or conditions that results in an automatic actuation of the Reactor Protection System.

The event is similar to that described in Section 15.2.7.2 of the Unit 1 FUSAR, which assumes a turbine trip without a direct reactor trip. However, since the turbine trip was preceded by a reactor trip in this

event, the actual plant response was more conservative than that described in the analysis.

Thus, the health and safety of the public was not threatened during the event.

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CORRECTIVE ACTIONS

- 1) Operations will revise the Duties and Responsibilities of Operators on Shift procedure to include guidance concerning sensitive systems or a reference to the Sensitive Systems Procedure. Operations Supervisor will write a night order regarding the use of the Sensitive Systems Procedure.
- 2) Technical Staff will coordinate a review of the Sensitive System Procedure with Operations and Maintenance and recommend improvements in implementation of this process.
- 3) I&C will write standard work descriptions to be attached to Nuclear Plant Work Orders related to replacement of RPS power supplies. The work description will include warnings, notes and detailed steps to perform the work. I&C will add a caution statement in I&C procedures to verify that TCB-1 through TCB-9 are shut prior to performing any RPS test.
- 4) I&C will counsel the I&C Supervisor on the importance of communicating to the ANPS in complete detail any manipulation to a sensitive system prior to initiating it.
- 5) Engineering will expedite plant changes for RPS power supply replacements.

ADDITIONAL INFORMATION

COMPONENT IDENTIFICATION:

This event was not caused by component failure.

ATTACHMENT 1 TO 8910180338 PAGE 1 OF 1

P.O. Box 14000, Juno Beach, FL 33408-0420

FPL OCTOBER 13, 1989

L-89-373
10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 89-05
Date of Event: September 13, 1989
Reactor Trip Due To
Inadequate Pre-Maintenance Review

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

DAS/JRH/gmp

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

*** END OF DOCUMENT ***
